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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/607,772

06/27/2003

Robert J. Royer JR.

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06/14/2006

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

P.O. BOX 2938

MINNEAPOLIS, MN 55402

EXAMINER

PEIKARI, BEHZAD

ART UNIT

PAPER NUMBER

2189

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/607,772

Applicant(s)

ROYER ET AL.

Examiner

B. James Peikari

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 21, 2006 has been entered.

Drawings

2. The drawings are objected to because the view numbers in the drawings filed on October 3, 2005 are not in accordance with 37 CFR 1.84(u)(1). For example, "FIG. 1" should replace "Fig. 1". The view numbers shown in the original drawings filed on June 27, 2003 were correct. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear to the examiner what is meant by "a memory cached by a non-volatile cache". Data can be invalidated, as described in applicant's disclosure, but "invalidating" memory is something different altogether.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-4, 6-12, 14, 16, 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moran et al., (US Patent 5,359,713) further in view of Handy (the Cache Memory book, Academic Press, 1998).

Moran et al. teach a method, comprising recording an address of a write operation to a memory cached by a non-volatile cache (Note solid state non-volatile memory buffer 150, which acts a lower level of cache hierarchy between cach 161 and the main and mass memories 117A and 117B. Note columns 11 and 12). Moran et al. does not specifically mention that recording an address of a write operation should be done prior to executing an operating system cache driver. However, it would have been

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obvious to one having ordinary skill in the art at the time the invention was made that this happens every time the computer 120 is booted or reset, because Moran explicitly states that one way of keeping track of access transactions (i.e., modifying data via writes, reads and erases) is by using an access transaction log. Note column 6, line 66, to column 7, line 14. By using such a log, the transactions and the addresses at which they occur are detected and recorded continuously at the time they occur so that if the system is *later* interrupted, reset or rebooted, and the boot drivers are initiated (including the cache drivers), such records in the log would have been made prior to boot, or else there would be no purpose in having such logs.

As for the additional feature of invalidating the data corresponding to the address of the write operation, note column 18, lines 21-36.

As for the log also being stored in a non-volatile memory, note again column 6, line 66, to column 7, line 14.

14. Claims 5 and 17-18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moran et al. (US Patent 5,359,713) in view of Lee et al. (US Patent 5,937,433).

As per claim 5, Moran et al. teach the method of claim 4 in the manner described above; however, Moran et al. do not teach that detecting the write operation further comprises trapping an interrupt request. Lee teaches the use of interrupt requests to detect write operations (Col 6, lines 6-8). The Lee and Moran et al. systems are compatible since they are in the same field of endeavor, namely cache control. It would

have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Lee with Moran et al. in order to properly detect write operations, since this would have been the proper handling of input/output requests in a computer system, and thus more efficient.

Lee further discloses the interrupt request is a basic input-output system interrupt request (Col 6, lines 6-7).

16. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkozy in view of Moran et al. (US Patent 5,359,713) in view of Heemels (US Patent 5,603,331).

As per claim 12, Moran et al. disclose the article of claim 10; but do not disclose the article wherein the data, when accessed, results in the machine performing setting a flag to indicate an overrun of the log. Heemels teaches setting a flag to indicate an overrun of the log (Col 9, lines 62-65). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Moran et al. with Heemels, adding the overflow flag of Heemels to the device of Moran et al. in order to provide for data integrity in the log. Heemels provides this motivation by indicating the flag would prevent the overrun of the log data array.

17. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moran et al. (US Patent 5,359,713) in view of the PC Guide.

As per claim 15, Moran et al. discloses the apparatus of claim 14; however he does not disclose that the address is a logical block address. According to a definition in PC Guide (Logical Block Addressing), LBA addressing is the dominant form of hard disk addressing. PC Guide shows that the motivation for using LBA is to allow for large hard disks that would otherwise not be supported by the BIOS. One of ordinary skill in the art would have found it obvious at the time the invention was made to combine Moran et al. with the LBA definition in PC Guide in order to provide large hard disk compatibility for the apparatus of claim 14.

18. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moran et al. and Lee as applied to claim 20 above, and further in view of PC Guide.

As per claim 22, Moran et al. and Lee discloses the system of claim 20, but do not disclose that the module of claim 20 is included in a basic input-output system. According to PC Guide, (BIOS Functions and Operation), a basic input-output system handles interrupts. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the module receiving interrupt requests associated with write operations into the BIOS.

Allowable Subject Matter

9. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).



B. James Peikari
Primary Examiner
Art Unit 2189
6/12/06